



30 March 2007  
File No. 32486-009

Department of Toxic Substances Control  
Tiered Permitting and Corrective Action Branch  
5796 Corporate Avenue  
Cypress, California 90630

Attention: Mr. John Geroch

Subject: Facility Investigation Report  
Delphi Corporation-Former Anaheim Battery Operations Facility  
1201 North Magnolia Avenue  
Anaheim, California

Dear Mr. Geroch:

On behalf of Delphi Corporation (Delphi), Haley & Aldrich, Inc. (Haley & Aldrich) is pleased to submit this Facility Investigation Report (FI) for the former Delphi Corporation automotive battery facility located at 1201 N. Magnolia Avenue, Anaheim, California. The FI Report has been prepared at the request of the California Department of Toxic Substances Control (DTSC) in accordance with the pending Corrective Action Consent Agreement (CACA) to protect human health and the environment and allow for Site redevelopment.

This report includes a summary of the known existing site conditions based on investigative work completed to date by Haley and Aldrich and others as well as a risk assessment to establish cleanup criteria for protection of human health and the environment. The cleanup criteria determined by the risk assessment are based on requirements of the DTSC and the results of the findings from the investigations.

Sincerely yours,  
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Facility Investigation Report - Delphi Corporation  
Former Anaheim Battery Operations Facility  
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Enclosures

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## EXECUTIVE SUMMARY

This Facility Investigation Report (FI) has been prepared by Haley & Aldrich, Inc. (Haley & Aldrich), on behalf of Delphi Corporation (Delphi), for Delphi's former Anaheim Battery Operations facility (Site) located at 1201 North Magnolia Avenue, Anaheim, California. The California Environmental Protection Agency Department of Toxic Substances Control (DTSC) Tiered Permitting Corrective Action Branch has requested that Delphi complete a Facility Investigation to adequately assess environmental impacts at the site and potential risks to human health and the environment from this Site. As part of the site assessment process, DTSC initially requested that a Current Conditions Investigation (CCI) be performed.

The review of the facilities existing reports and preliminary data collected for the CCI identified 54 Areas of Interest (AOIs) at the Site. AOIs identified by Haley & Aldrich are areas associated with the Site where hazardous compounds are known to occur or suspected of occurring due to past manufacturing processes, treatment, storage or disposal (or release) of hazardous waste, hazardous substances based on visual observations, historic documents, photographic interpretation or other evidence. AOIs identified included thirteen previously identified Solid Waste Management Units (SWMUs) as well as recognized environmental conditions (RECs) identified during a Phase I Environmental Site Assessment (ESA). In addition, other areas of potential environmental concern were identified by Haley & Aldrich during the CCI. The decision to perform initial sampling at a specific AOI was based on its operational history and configuration, previous investigation results, chemical processes, and observable staining.

The Sampling and Analysis Plan (Haley & Aldrich, 2005) implemented for the CCI was based on information presented in previous environmental reports prepared for the Site, and on historical information regarding the types of chemicals known to have been used, or likely used, in the various operations on the site and observations made during site reconnaissance by Haley & Aldrich staff. Prior to its implementation, the CCI sampling program was discussed with DTSC. The sampling program involved the collecting of soil, soil gas, groundwater, and concrete samples. Soil samples were tested for a variety of constituents including metals, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), including polynuclear aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), and polychlorinated biphenyls (PCBs), and seventeen metals by the California Assessment Method (CAM-17). Soil gas samples were analyzed for VOCs. Groundwater was analyzed for metals, VOCs, PCBs and SVOCs. Concrete chip and core samples were analyzed primarily for lead, PCBs, and arsenic, and occasionally for SVOCs.

The findings of the CCI were presented in a Current Conditions Report (CCR) prepared by Haley & Aldrich, dated 3 February 2006. The CCR summarized the initial subsurface investigation activities and discussed the preliminary findings for concrete, soil, soil gas, and groundwater impacts. The chemicals of potential concern (COPC) identified include metals (primarily lead, arsenic and antimony), VOCs, PAHs, and PCBs in soil, and various VOCs in soil gas and groundwater. Analytical results of some soil and concrete samples indicated that, based on the assumed risk-based cleanup criteria, some areas of impacted concrete and soil would require removal and disposal off-site. In addition, elevated concentrations of VOCs that would require remediation were found in soil gas. Low concentrations of VOCs that would require further evaluation and monitoring were found in groundwater.



The determination of whether an impacted area was considered delineated was based on the chemical concentrations being less than the cleanup criteria, decreasing chemical concentration trends in successive step-outs (substantial attenuation), or direct observations of an apparent release (e.g., discolored concrete, or discolored soil) clearly defines the lateral limits of contamination. Based on the findings of the CCR, Haley & Aldrich was of the opinion that 28 of the 54 AOIs were deemed fully delineated and no further investigation was warranted. The remaining 26 AOIs found to be impacted were determined to require additional delineation either during the subsequent Facility Investigation (FI) phase, or as part of the Remedial Action.

During the initial building slab demolition oversight review and sampling in late 2005, several additional impacts were identified at the site. These newly identified impacted areas included PCB and arsenic impacted areas on the west side of the site and in the Main Production Building. On the west side of the site, stains were observed or elevated concentrations detected in samples north of AOI 30, south of AOI 26, south of AOI 27 and adjacent to AOIs 41, 42 and 43. In the Main Production Building, purple stained concrete was observed in the forklift repair area of AOI 10 (SWMU No. 9), in AOIs 5 and 6, and in the AGM containment and Green Group Maintenance areas west of AOI 13.

Subsequent to the findings presented in the CCR, the DTSC requested that a Facility Investigation (FI) Work Plan be prepared and implemented to further assess site impacts. The proposed scope of work for the FI was presented in a FI Work Plan prepared by Haley & Aldrich, dated 28 April 2006 and submitted to DTSC for review in June 2006. Additional investigation work for the FI was performed from June through September 2006. This work included advancing and sampling an additional 233 soil borings, eight groundwater wells, five groundwater grab sample points, and 31 soil gas points.

The information presented in this FI Report includes both historical data derived from archives, investigations by others, and the data collected by Haley & Aldrich during the CCI, demolition oversight and the additional sampling (including step-down and step-out sampling) performed for the Facility Investigation during 2006.

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## ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
AETL	American Environmental Testing Laboratory
AOI	Area of Interest
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, xylene
Cal-EPA	California Environmental Protection Agency
CAM	California Assessment Method
CAM-17	California Assessment Method for Metals
CCI	Current Conditions Investigation
CCR	Current Conditions Report
cfs	cubic feet per second
CHHSL	California Human Health Screening Level
COC	Chain-Of-Custody
COPC	Chemical of Potential Concern
COS	cast on strap
CRA	Conestoga-Rovers & Associates
CUPA	Certified Unified Program Agency
DCA	dichloroethane
DCE	dichloroethene
DHS	California Department of Health Services
DO	dissolved oxygen
DTSC	California Environmental Protection Agency Department of Toxic Substances and Control
E&E	Ecology and Environment, Inc.
EDR	Environmental Data Resources, Inc.
ESA	Environmental Site Assessment
FI	Facility Investigation
GM	General Motors
gpm	gallons per minute
HASP	Health and Safety Plan
HHRA	Human Health Risk Assessment
HO	hydraulic oil
I-5	Interstate 5
IDL	Instrument Detection Limit
IDW	investigation-derived waste
ILCR	incremental lifetime cancer risk
IM	Interim Measures

LCS	Laboratory Control Sample
LFR	Levine-Fricke
LUST	leaking underground storage tank
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
µg/m <sup>3</sup>	micrograms per cubic meter
MCL	CADHS Drinking Water Maximum Contaminant Level
MDL	Method Detection Limit
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
ml	milliliter
ml/min	milliliters per minute
MS	Matrix Spike
MSD	Matrix Spike Duplicate
msl	Mean Sea Level
MWD	Metropolitan Water District
NFRAP	No Further Response Action Planned
NTU	Nephelometric Turbidity Unit
OCHCA	Orange County Health Care Agency
OEHHHA	Office of Environmental Health Hazard Assessment
ORP	oxidation-reduction potential
PAH	polynuclear aromatic hydrocarbons
PAOL	Potential Area of Liability
PBR	Permit-by-Rule
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PEA	Preliminary Environmental Assessment
PID	Photo-ionization Detector
POTW	Publicly Owned Treatment Works
PPE	personal protective equipment
ppm	parts per million
PRG	USEPA Preliminary Remediation Goal
PVC	polyvinyl chloride
QAPP	Quality Assurance Project Plan
QA/QC	quality assurance and quality control
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RL	reporting limit
ROP	Regional Occupational Program
RWQCB	Regional Water Quality Control Board
STLC	Soluble Threshold Limit Concentration



SVOC	semi-volatile organic compound
SWMU	Solid Waste Management Unit
TCA	trichloroethane
TCLP	Toxicity Characteristic Leaching Procedure
TPH	total petroleum hydrocarbons
TRPH	total recoverable petroleum hydrocarbons
TTLC	Total Threshold Limit Concentration
USCS	ASTM Unified Soil Classification System
USEPA	United States Environmental Protection Agency
UST	underground storage tank
ug/L	microgram/Liter
VOC	volatile organic compound
VSI	visual site inspection
WET	Waste Extraction Test
WWTU	Wastewater Treatment Unit
XRF	X-Ray Fluorescence

## **1. INTRODUCTION**

This Facility Investigation Report (FI) has been prepared by Haley & Aldrich, Inc. (Haley & Aldrich), on behalf of Delphi Corporation (Delphi), for the former Delphi Anaheim Battery Operations facility (Site) located at 1201 North Magnolia Avenue, Anaheim, California. The location of the Site is shown on Figure 1. Delphi is working voluntarily with the California Environmental Protection Agency Department of Toxic Substances Control (DTSC) Tiered Permitting Corrective Action Branch to adequately characterize Site conditions, assess potential risks to human health and the environment, and remediate the Site for redevelopment.

### **1.1 Purpose**

The purpose of the FI Report is to summarize site data collected to date by Haley & Aldrich and others and to describe the current conditions of 53 Areas of Interest (AOIs) (Figure 2) and others areas identified with potential environmental impacts at the Site, which includes previously identified Solid Waste Management Units (SWMUs), recognized environmental conditions (RECs), and other areas of potential environmental concern identified during the data review, demolition oversight, CCI and FI phases of work for this site. This FI Report focuses on subsurface investigation activities for concrete, soil, soil gas, and groundwater impacts. The information presented in this FI Report includes both historical data collected by others, and data collected by Haley & Aldrich during the demolition oversight work, CCI in 2005 (Haley & Aldrich, 2005), and the step out and down sampling performed for the FI in 2006.

### **1.2 Organization of Report**

This FI is organized as follows:

- Section 1: Introduction
- Section 2: Facility Description
- Section 3: Facility History
- Section 4: Environmental Setting
- Section 5: Sampling Activities and Procedures
- Section 6: Summary of Findings and Analytical Results
- Section 7: Data Validation
- Section 8: HASP Implementation
- Section 9: Recommendations
- Section 10: References
- Tables
- Figures
- Appendices including:

- Appendix A - Historical Documents
- Appendix B - Site Photographs
- Appendix C - Soil Analytical Data Reports
- Appendix D - Soil Gas Analytical Data Reports
- Appendix E - Groundwater Analytical Data Reports
- Appendix F - Concrete Analytical Data Reports
- Appendix G - Human Health Risk Assessment
- Appendix H - Groundwater Monitoring Well Permits, Boring Logs, and Field logs
- Appendix I - Boring Logs



## 2. FACILITY DESCRIPTION

The Site consists of approximately 22+ acres at 1201 North Magnolia Avenue in a commercial/industrial section of the City of Anaheim, Orange County, California (Figure 1). The original building was constructed in 1953 by Delco-Remy, a Division of General Motors, for the production of automotive batteries. A review of previous environmental reports indicates that additional major on-site construction activities also occurred in 1963, 1974, and 1977 for a warehouse and production line buildings. Prior to the 2005 decommissioning and plant demolition, the Site consisted of

- Main Production Building,
- South Building (New Charge Building),
- Three warehouses (Warehouses No. 1, No.2 and No. 3),
- Railroad siding,
- Waste Water Treatment Unit,
- Storm Water Retention Basin, as well as,
- Numerous asphalt or concrete paved areas outside the buildings.

The area of the Main Production Building was approximately 187,000 square feet, with smaller production and storage buildings present to the south and west. A Site plan of the former facility is shown on Figure 2.

The Main Production Building, which was built in 1953, was a slab-on-grade with a steel frame structure with wall construction of brick and block. The ceiling of the Main Production Building was open with skylights and metal support beams. The office area, which comprised a relatively small portion of the eastern side of the Main Production Building also had vinyl tile floors, suspended ceilings with fluorescent lights and wood paneled wall dividers.

The ancillary buildings were also of slab-on-grade construction and either metal frame with sheet metal or masonry block walls with wood and metal roofs.

Also associated with the Site were landscaped areas, employee parking lots, driveways, and loading docks. An open area (approximately 2 acres) on the far north part of the site was previously owned by Delphi but was sold to the City of Anaheim in 2002, along with access easements, for use as Little League baseball fields. Most of the Site is paved with the exception of the lawn and planter areas located north and east of the Main Production Building, and the gravel-covered former storage and truck/van parking area located northwest of the Main Production Building.

### 3. FACILITY HISTORY

Information presented herein regarding Delphi's activities at the Site from 1953 to the present is based upon the various documents provided by Delphi and identified within the reference section of this report. The following sections summarize Site ownership, known operational history of the Site, manufacturing processes, regulatory history, waste generation, waste managements, spill history, and previous Site investigations and actions.

#### 3.1 Ownership History

A review of historical aerial photographs and topographic maps indicates that prior to construction of the battery manufacturing facility, the Site was used for agricultural purposes as an orange grove (Appendix A). Construction grading at the Site was evident in the 1953 aerial photograph included with the Environmental Data Resources, Inc. (EDR) report (Appendix A). Delco-Remy (General Motors) originally began manufacturing lead acid automobile batteries at this Site in 1954. From 1954 to 1999, the Site was owned by various divisions of General Motors (GM). In January 1999, Delphi Automotive Systems separated from GM to form a new company. Later, the company was renamed Delphi Corporation. Most recently, the Site operated as the Delphi Automotive Holdings Group, Division of Delphi Corporation.

The Site currently consists of approximately 22+ acres. The Site was formerly occupied by an active, one-story manufacturing building with a total of approximately 187,000 square feet of floor space, three warehouse buildings, and an ancillary building. Historically the northernmost portion of the property included two baseball fields that were leased to and used by the local Little League baseball organization by the mid-1960s (EPA, 1991, Appendix A - EDR). In 2002, Delphi (successor of Delco-Remy) sold this northern area to the City of Anaheim for continued use as baseball fields.

#### 3.2 Operational History

The Site is located in a commercial/industrial section of the City of Anaheim, Orange County, California. The site was used as agricultural for citrus groves from around the 1920s until construction of the automotive battery manufacturing facility by Delco-Remy, a former Division of General Motors, in 1953. Delco-Remy used a wet soluble process to manufacture the various battery models, totaling approximately three million maintenance free lead acid automotive batteries per year during the more recent years of operation. Operations included the manufacture of lead acid batteries including the plastic battery casings; testing defective batteries returned under warranty; treating wastewater; short term storage of hazardous waste; treatment of wastewater and maintaining the manufacturing equipment.

The following materials were used in the production of lead acid batteries at the Site:

- **Lead and lead tetraoxide used in the production of lead plates:** Lead was received in 2,000 pound ingots (hogs) and was stored in the production area on pallets. The majority of the lead was extruded and cut into plates. The remainder was converted into lead oxide, prepared by the oxidation of metallic lead, the major ingredient of the paste placed on the plates.



- **Sulfuric acid, which acts as the battery electrolyte:** Sulfuric acid was stored in tanks, mixed in the acid house, and transported to and from the acid filling and acid draining areas through overhead pipes.
- **Battery cases and covers forming:** Polypropylene pellets were delivered by train cars to two silos on-site. This material was pneumatically transferred to the case and cover-forming areas in the plant where it was melted and extruded to form battery cases and covers.
- **Polyethylene envelopes used to separate the oppositely charged plates:** Polyethylene film was received in roll form by truck, stored in the production area, and formed into envelopes for the anion plates within the battery.

Smaller quantities of the following materials were also used in battery production or found in the major raw materials:

- Antimony (in lead alloy used in the early process prior to mid-1980s)
- Arsenic (in lead alloy used in manufacturing)
- Soluble Oil (used to lubricate the lead as it was rolled to a specified thickness)
- Anti-corrosion compound for terminals
- Hot melt (glue used to bond the plastic case to the internal lead strap)
- Paper (wood pulp) (used to make the paper labels placed on the exterior case)
- Tin (in lead alloy used in the new process, circa mid-1980s)
- Calcium (in lead alloy used in the new process, circa mid-1980s)
- Lignosulfonic acid
- Caustic soda
- Silver
- Colloidal carbon

Materials used in support operations include hydraulic oil; propane; water and wastewater treatment chemicals such as sodium hydroxide, coagulants, and biocides; gasoline; and maintenance-related chemicals. Oils and other chemicals were stored in underground or above ground tanks, containers, at points of use, or in the hallway near the boiler room. Other storage or staging areas also included the loading dock, paved areas on the west side of the site and later inside of the warehouses on the west side of the site. Finished batteries, containing approximately one gallon of acid solution each, were stored in the warehouses prior to shipping. The railroad line was used to deliver plastic for the casings. Sulfuric acid was delivered to the Site by trucks. Historic documents and Site personnel interviewed did not indicate that significant spills or releases of any of the chemicals were known to have occurred.

Manufacturing areas occupied most of the Main Production Building. The manufacturing areas included the encapsulation operation, case and cover molding and assembly areas, lead plate manufacturing area, battery assembly, and battery wet finishing and charging areas, lead